

What is claimed is:

1. A thermally-assisted magnetic recording disk comprising:
a substrate;
an antiferromagnetic-to-ferromagnetic switching layer of FeRh on the substrate and having an antiferromagnetic-to-ferromagnetic transition temperature; and
a ferromagnetic recording layer on the substrate and in contact with the switching layer and having a Curie temperature greater than the antiferromagnetic-to-ferromagnetic transition temperature of the switching layer, the switching layer and recording layer being exchange-coupled ferromagnetically when the switching layer is in its ferromagnetic state.
2. The disk of claim 1 wherein the FeRh comprises Fe(RhM), where M is an element selected from the group consisting of Ir, Pt, Ru, Re and Os.
3. The disk of claim 2 wherein the Fe(RhM) is $\text{Fe}_x(\text{Rh}_{100-y}\text{M}_y)_{100-x}$, where $(0 < y \leq 15)$ and $(40 \leq x \leq 55)$.
4. The disk of claim 1 wherein the recording layer is formed on top of the switching layer.
5. The disk of claim 4 further comprising a seed layer between the substrate and the switching layer.

6. The disk of claim 1 further comprising a protective overcoat formed over the recording layer.
7. The disk of claim 1 wherein the recording layer has substantially perpendicular magnetic anisotropy.
8. The disk of claim 1 wherein the recording layer has substantially horizontal magnetic anisotropy.
9. The disk of claim 1 wherein the substrate is glass.

10. A thermally-assisted magnetic recording disk comprising:

a substrate;

a layer of antiferromagnetic-to-ferromagnetic switching material on the substrate, the switching material having an antiferromagnetic-to-ferromagnetic transition temperature and comprising $\text{Fe}_x(\text{Rh}_{100-y}\text{M}_y)_{100-x}$, where $(0 \leq y \leq 15)$ and $(40 \leq x \leq 55)$, and M is an element selected from the group consisting of Ir, Pt, Ru, Re and Os;

a layer of ferromagnetic recording material formed on and in contact with the switching layer and having a Curie temperature greater than the antiferromagnetic-to-ferromagnetic transition temperature of the switching layer, the switching layer and recording layer being exchange-coupled ferromagnetically when the switching layer is in its ferromagnetic state; and

a protective overcoat formed on the recording layer.